WHAT IS CLAIMED IS:

1. A method of positioning a catheter proximate to a junction in a hollow anatomical structure of a patient, the method comprising the steps of:

introducing a catheter into the hollow anatomical structure;

identifying the junction in the hollow anatomical structure based on feedback from the catheter without imaging the hollow anatomical structure;

positioning the working end of the catheter proximate the junction identified in the step of identifying.

2. The method of claim 1 wherein the junction in the step of identifying is the sapheno-femoral junction.

3. The method of claim 1 wherein the feedback in the step of identifying is light emitted from a fiber optic device, and an attribute of the light changes upon reaching the junction of the hollow anatomical structure.

4. The method of claim 3 wherein the step of introducing the catheter further includes the step of introducing the catheter over a fiber optic device.

5. The method of claim 3 further including the step of measuring the length of the fiber optic device introduced into the patient until the attribute of the light changes.

6. The method of claim 5 further including the step of removing the fiber optic device after the step of measuring.

7. The method of claim 5 wherein the step of positioning further includes the step of inserting the catheter for the same length as measured in the step of measuring the length of the fiber optic device.

8. The method of claim 1 wherein the feedback in the step of identifying includes a magnetic field generated at the working end of the catheter.

9. The method of claim 1 wherein the feedback in the step of identifying includes a magnetic field sensed by the catheter.

10. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire; wherein the feedback in the step of identifying includes a magnetic field generated by the guide wire.

11. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire; wherein the feedback in the step of identifying includes a magnetic field generated at the guide wire.

12. The method of claim 1 wherein the feedback in the step of identifying includes a radio-frequency signal generated at the catheter.

13. The method of claim 1 wherein the feedback in the step of identifying includes a radio-frequency signal sensed by the catheter.

14. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire;

wherein the feedback in the step of identifying includes a radio-frequency signal generated by the guide wire.

15. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire; wherein the feedback in the step of identifying includes a radio-frequency signal sensed by the guide wire.

16. The method of claim 1 wherein the source of the feedback in the step of identifying includes a hook-shaped tip located at the distal end of a guide wire, wherein the guide wire traverses a lumen in the catheter, and the hook-shaped tip engages the junction of the hollow anatomical junction.

17. The method of claim 1 wherein the source of the feedback in the step of identifying includes a hook-shaped tip located at the working end of the catheter, and the hook-shaped tip engages the junction of the hollow anatomical junction.

18. The method of claim 1 wherein the source of the feedback in the step of identifying further includes impedance measurement.

19. The method of claim 1 wherein the source of the feedback in the step of identifying includes an ultrasound signal generated at the working end of the catheter.

20. The method of claim 1 wherein the source of the feedback in the step of identifying includes an ultrasound signal sensed by the catheter.

21. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire;

wherein the feedback in the step of identifying includes an ultrasound signal generated by the guide wire.

22. The method of claim 1 wherein the step of introducing the catheter further includes the step of introducing the catheter over a guide wire; wherein the feedback in the step of identifying includes an ultrasound signal sensed by the guide wire.

23. A method of positioning a catheter within a hollow anatomical structure, the method comprising the steps of:

introducing a fiber optic device into the hollow anatomical structure;

emitting light from the fiber optic device;

monitoring an attribute of the light emitted by the fiber optic device;

identifying the location within the hollow anatomical structure where the monitored attribute of the light emitted by the fiber optic device changes;

measuring the length of the fiber optic device introduced into the patient during the step of identifying;

introducing a catheter having a working end into the hollow anatomical structure;

positioning the working end of the catheter proximate the location identified in the step of identifying.

24. The method of claim 23 wherein the location in the step of identifying is the sapheno-femoral junction.

25. The method of claim 23 wherein the attribute of the light is no longer externally visible in the step of identifying.

26. The method of claim 23 wherein the step of introducing the catheter further includes the step of introducing the catheter over the fiber optic device.

27. The method of claim 23 further including the step of removing the fiber optic device after the step of measuring.

28. The method of claim 23 wherein the step of positioning further includes the step of inserting the catheter for the same length as measured in the step of measuring the length of the fiber optic device.

29. The method of claim 23 further comprising the step of applying energy to the hollow anatomical structure at the treatment site via an energy application device at the working end of the catheter until the hollow anatomical structure durably assumes a smaller size.

30. A method of positioning a catheter within a hollow anatomical structure, the method comprising the steps of:

introducing a catheter having a working end and a fiber optic device into the hollow anatomical structure;

emitting light from the fiber optic device;

positioning the working end of the catheter at a desired location within the hollow anatomical structure where an attribute of the light emitted by the fiber optic device changes.

31. The method of claim 30 wherein the location in the step of positioning is the sapheno-femoral junction.

32. The method of claim 30 wherein the step of introducing further includes the step of providing the fiber optic device through a central lumen in the catheter.

33. The method of claim 32 further including the step of removing the fiber optic device through the central lumen of the catheter after the step of positioning.

34. The method of claim 30 further comprising the step of applying energy to the hollow anatomical structure at the treatment site via an energy application device at the working end of the catheter until the hollow anatomical structure durably assumes a smaller size.

35. A method of positioning a catheter within a hollow anatomical structure, the method comprising the steps of:

determining a desired location within the hollow anatomical structure;

marking externally the desired location;

introducing a catheter having a working end and a transducer at the working end into the hollow anatomical structure;

identifying the location of the transducer at the working end of the catheter;

positioning the working end of the catheter at the desired location within the hollow anatomical structure the transducer is aligned with the external marking.

36. The method of claim 35 wherein the location in the step of positioning is the sapheno-femoral junction.

37. The method of claim 35 wherein the step of identifying further includes the step of placing a hand-held device externally over the hollow anatomical structure, wherein the hand-held device identifies the location of the transducer at the working end of the catheter.

38. The method of claim 35 further comprising the step of generating a magnetic field at the working end of the catheter to provide the transducer.

39. The method of claim 35 further comprising the step of generating a radio-frequency field at the working end of the catheter to provide the transducer.

40. The method of claim 35 further comprising the step of generating an ultrasound signal at the working end of the catheter to provide the transducer.

41. The method of claim 35 further comprising the step of applying energy to the hollow anatomical structure at the treatment site via an energy application device at the working end of the catheter until the hollow anatomical structure durably assumes a smaller size.

42. A method of positioning a catheter within a hollow anatomical structure, the method comprising the steps of:

introducing a catheter having a working end with an energy application device at the working end into the hollow anatomical structure;

compressing the hollow anatomical structure at the treatment site to a compressed size;

detecting the flow rate through the hollow anatomical structure during the step of compressing;

positioning the working end of the catheter proximate a location within the hollow anatomical structure based on the change detected in the flow rate in the step of detecting.

43. The method of claim 42 wherein the location in the step of positioning is the sapheno-femoral junction.

44. The method of claim 42 wherein the step of detecting further includes the step of sensing the temperature decay with a temperature sensor located at the working end of the catheter as an anemometer.

45. The method of claim 42 further comprising the step of applying energy to the hollow anatomical structure at the treatment site via an energy application device at the working end of the catheter until the hollow anatomical structure durably assumes a smaller size.

46. The method of claim 42 further comprising the step of applying energy via an energy application device at the working end of the catheter for a short period of time sufficient to cause a measurable hearing effect; reducing the application of energy; wherein the step of detecting the flow rate includes measuring the temperature decay after the step of ceasing the application of energy.

47. The method of claim 42 further comprising the step of applying energy via an energy application device at the working end of the catheter sufficient to maintain a constant temperature; wherein the step of detecting the flow rate includes measuring the amount of energy required to maintain the constant temperature.

48. The method of claim 42 further comprising the step of applying a constant amount of energy via an energy application device at the working end of the catheter to cause a measurable heating effect; wherein the step of detecting the flow rate includes measuring the temperature adjacent the catheter.

49. The method of claim 42 further comprising the step of introducing a flow wire into the hollow anatomical structure.

50. A method of positioning a catheter within a hollow anatomical structure, the method comprising the steps of:

introducing a guide wire having a hook-shaped tip into the hollow anatomical structure;

hooking the hook-shaped tip of the guide wire to the ostium of a junction within the hollow anatomical structure;

introducing a catheter having a working end into the hollow anatomical structure over the guide wire;

positioning the working end of the catheter proximate the junction identified in the step of hooking.

51. The method of claim 50 wherein the junction in the step of hooking is the sapheno-femoral junction.

52. The method of claim 50 wherein the step of positioning further includes the step of stopping the advancement of the catheter by a mechanical stop located proximal to the hook-shaped tip of the guide wire.

53. The method of claim 50 further comprising the step of measuring the length of the guide wire introduced into the patient in the step of hooking.

54. The method of claim 50 further comprising the step of applying energy to the hollow anatomical structure at the treatment site via an energy application device at the working end of the catheter until the hollow anatomical structure durably assumes a smaller size.

55. An apparatus for applying energy to a hollow anatomical structure, the apparatus comprising:

a catheter having a working end;

an electrode device disposed at the working end;

a fiber optic device disposed at the working end, wherein the fiber optic device is capable of emitting light.

56. The apparatus of claim 55 wherein the catheter further includes a guide wire lumen.

57. The apparatus of claim 55 wherein the electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into non-penetrating contact with the hollow anatomical structure.

58. The apparatus of claim 55 wherein the electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into contact with the hollow anatomical structure and the electrodes do not prevent the collapse of the hollow anatomical structure.

59. An apparatus for applying energy to a hollow anatomical structure, the apparatus comprising:

a catheter having a working end;

an electrode device disposed at the working end of the catheter;

a hook-shaped tip disposed at the working end of the catheter.

60. The apparatus of claim 59 wherein the hook-shaped tip is formed from a shape memory metal.

61. The apparatus of claim 50 wherein the catheter includes a heating device to heat the hook-shaped tip to a specific temperature, wherein the hook-shaped tip changes shape above the specific temperature.

62. The apparatus of claim 59 wherein the hook-shaped tip is flexible, and the hook shape of the tip is formed by a deflecting wire attached to the tip.

63. The apparatus of claim 59 wherein the catheter includes further electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into non-penetrating contact with the hollow anatomical structure.

64. The apparatus of claim 59 wherein the electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into contact with the hollow anatomical structure and the electrodes do not prevent the collapse of the hollow anatomical structure.

65. A guide wire comprising a tip having a hook shape and a mechanical stop proximal to the tip.

66. The apparatus of claim 65 wherein the hook-shaped tip is formed from a shape memory metal, wherein the hook-shaped tip changes shape above a specific temperature.

67. The apparatus of claim 65 wherein the hook-shaped tip is flexible, and the hook shape of the tip is formed by a deflecting wire attached to the tip.

68. The apparatus of claim 55 further comprising a catheter having a lumen through which the guide wire is inserted, and an electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into non-penetrating contact with the hollow anatomical structure.

69. The apparatus of claim 65 further comprising a catheter having a lumen through which the guide wire is inserted, and an electrode device includes a plurality of expandable electrodes, where the electrodes expand outwardly into contact with the hollow anatomical structure and the electrodes do not prevent the collapse of the hollow anatomical structure.